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PATENT
Attorney Docket No.: 03626.0034-09
Customer No. 22,852

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	)	
	)	
Ernest L. LAWTON et al.	)	
	)	
Application No.: 09/705,575	)	Group Art Unit: 1774
	)	
Filed: November 3, 2000	)	Examiner: J. Gray
	)	
For: IMPREGNATED GLASS FIBER STRANDS AND PRODUCTS INCLUDING THE SAME	)	

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

APPEAL BRIEF UNDER 37 C.F.R. § 1.192

This is an appeal to the Board of Patent Appeals and Interferences ("the Board") from the final Office Action dated July 31, 2003. Claims 1-3 and 6-37 are pending in this application. Claims 12-17, 26-31, and 35-37 remain withdrawn from consideration as being directed to non-elected species of invention. The pending claims are set forth in the attached Appendix.

In support of the Notice of Appeal filed January 30, 2004, the period of response having been extended by the Petition for Extension of Time and fee filed concurrently herewith, and pursuant to 37 C.F.R. § 1.192, Appellants present in triplicate this Brief and encloses herewith a check for the fee of $1180.00 as required under 37 C.F.R. §§ 1.17(a)(4) and 1.17(c). If any additional fees are required or if the enclosed

payment is insufficient, Appellants request that the required fees be charged to Deposit Account No. 06-0916.

I. REAL PARTY IN INTEREST

PPG Industries Ohio, Inc. is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

Appellants' undersigned legal representative knows of no other appeals or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

In an abundance of caution, however, Appellants' undersigned legal representative brings to the Board's attention co-pending Application No 09/706,268. A Notice of Appeal was filed March 2, 2004, in this co-pending application, and an Appeal Brief is expected to be filed in the near future.

III. STATUS OF CLAIMS

Claims 1-3 and 6-37 are pending in this application. Claims 12-17, 26-31, and 35-37 remain withdrawn from consideration as being directed to non-elected species of invention. No claim has been allowed.

IV. SUMMARY OF INVENTION

The claims of the present invention relate to coated fiber strands that can be incorporated into a matrix or woven into fabrics, which are generally used for reinforcing composite materials. The coating on the fiber strands should protect the fiber strands from abrasion during processing and use, but also must allow for good weavability into a matrix or fabric. Further, impurities in the matrix or woven fabric are often eliminated through heat, i.e. elevating the temperature of the matrix or woven fabric so that the

impurity thermally decomposes. However, such heat cleaning steps can diminish the strength of the glass fibers and the effectiveness of the coating. Until this invention, there remained a need for coatings that could, for example, inhibit abrasion and breakage of glass fibers, be physically compatible with a wide variety of composite materials, as well as be compatible with the desired function.

The present invention offers a unique coating that not only inhibits abrasion and breakage of fibers during use, but has superior physical and functional characteristics as well, such as good laminate strength, good thermal stability, good hydrolytic stability, and low tendency for corrosion.

V. ISSUES

The issues presented for appeal are as follows:

1. Whether claims 1, 2, 18-21, 24, 25, 32, and 33 are patentable under 35 U.S.C. § 102(b) over U.S. Pat. Nos. 5,024,890, 5,312,687, and 5,387,468 to Pollet et al. (cumulatively "Pollet"); and

2. Whether claims 3, 6-11, 22, 23, and 32-34 are patentable under 35 U.S.C. § 103(a) over Pollet in view of U.S. Pat. No. 5,460,883 to Barber, Jr. et al. ("Barber") and U.S. Pat. No. 6,270,562 to Jia ("Jia").

VI. GROUPING OF CLAIMS

Each claim of this patent application is separately patentable, and upon issuance of a patent will be entitled to a separate presumption of validity under 35 U.S.C. § 282. For convenience in handling this appeal, however, the claims will be grouped into two groups:

1. Regarding the rejection under 35 U.S.C. § 102(b) over Pollet, claims 1, 2, 18-21, 24, 25, 32, and 33 stand or fall together; and

2. Regarding the rejection under 35 U.S.C. § 103(a) over Pollet in view of Barber and Jia, claims 3, 6-11, 22, 23, and 32-34 stand or fall together.

VII. ARGUMENTS

A. Rejection under § 102(b)

The Examiner rejected claims 1, 2, 18-21, 24, 25, 32, and 33 under 35 U.S.C. § 102(b) as being anticipated by Pollet. Appellants submit that a prima facie case of anticipation has not been established for the reasons set forth below.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. M.P.E.P. § 2131. A rejection under § 102 is only proper when the claimed subject matter is identically described or disclosed in the prior art. *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972). That is, in order to identically describe or disclose, for example, the powdered coating composition recited in independent claims 1 and 32, and be anticipatory within the meaning of section 102, the reference must teach "[t]he identical invention ... in as complete detail as is contained in the patent claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989) (citations omitted). For example, in the case of a claimed compound the "reference must clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without any need for picking, choosing, and combining various disclosures

.... Such picking and choosing ... has no place in the making of a 102, anticipation rejection." *In re Arkley*, 455 F.2d at 587-88.

1. Plurality of Particles

Independent claim 1 recites that the claimed plurality of particles are "selected from inorganic particles, organic hollow particles, composite particles, and mixtures of any of the foregoing." *See* claim 1. Independent claim 32 recites that the claimed plurality of particles are "selected from inorganic particles, organic hollow particles, and composite particles." *See* claim 32.

The Examiner alleges that "[I]t should be noted that the language of particles embraces thermoplastic resin powder." Office Action dated February 13, 2003, at page 3. Appellants disagree, and submit that claims 1 and 32 clearly recite what the "plurality of particles" language embraces: "inorganic particles," "organic hollow particles," and "composite particles," and mixtures thereof. Thus, to meet the "plurality of particles" limitation, the Examiner must show how the reference teaches "inorganic particles," "organic hollow particles," and "composite particles." The Examiner has failed to do so for the reasons that follow.

In the rejections of record, the Examiner alleges that Pollet teaches "the powdered coating can contain organic or inorganic particulates that can be either pre-combined with the polymer so that each powder particles [sic] contains polymer and filler, or be added separately as a powder." Office Action dated February 13, 2003, at page 3. The Examiner also alleges that "[i]t should be noted that the language of particles embraces thermoplastic resin powder." *Id.* The Examiner further reasoned

that "if each powder particle contains polymer and filler, as taught by Pollet, the skilled artisan would reasonably presume that the fillers are either a) coated with the polymer or b) flocked on the surface of the polymer particle." Final Office Action at page 3.

Appellants submit there exists no disclosure regarding the identity and amount of the optional, inorganic particulates. Pollet also fails to teach, nor does the Examiner allege, the "organic hollow particles" recited in these claims. Thus, Pollet fails to teach the "inorganic particles" and the "organic hollow particles" recited in claims 1 and 32.

Appellants additionally submit that the use of organic or inorganic particulates, such as metallic fillers, in combination with thermoplastic polymer particles is an optional component. *See,* e.g. col. 4, lines 1-5 of U.S. Patent No. 5,024,890 ("organic or inorganic particulates . . . may also be used with the thermoplastic polymer powder particles")(emphasis added). Notably, these components may also "be added separately," if the particulates are even used at all. *Id.* at col. 4, lines 7 and 8. Additionally, no teaching exists in Pollet that discloses the amount of particulate that may be used with the thermoplastic polymer powder particles. Since these particulates are optional components, and since no guidance is given regarding the amount of the particulates, one of ordinary skill in the art would need to pick and choose these optional components and amounts for inclusion in the compositions disclosed in Pollet. As emphasized above, however, picking and choosing has no place in the making of a §102 anticipation rejection. *See In re Arkley*, 455 F.2d at 587-88. Thus, Pollet also fails to teach the "composite particles" recited in claims 1 and 32.

2. Mohs' Hardness Value

Turning to the Mohs' hardness limitations recited in independent claims 1 and 32, the Examiner asserts, without support, that "the inorganic particulates can be metallic fillers. This teaching inherently describes particles that have a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fibers." Final Office Action at pages 3 and 4. Appellants respectfully submit that nothing in Pollet describes any inorganic particles that inherently or explicitly have a Mohs' hardness that does not exceed the Mohs' hardness of the glass fiber, as claimed.

The Federal Circuit explained the standard for determining inherency:

> Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. If, however, the disclosure is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient.

Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 1268-69 (Fed. Cir. 1991) (quoting *In re Oelrich*, 666 F.2d 578, 581, (C.C.P.A. 1981)).

Thus, inherency must flow as a necessary conclusion from the prior art, not simply a possible one. Appellants submit that the relative hardness varies depending on many factors, including the type of metal and glass used. The possibility that the fillers used in Pollet may have a Mohs' hardness value that does not exceed the Mohs' hardness value of the glass fibers is not enough. Moreover, page 27 of the present specification discloses that the Mohs' hardness of glass fibers can be 4.5 (line 10), and page 28 of the present specification shows that the Mohs' hardness of certain inorganic

particles can be higher (e.g, iron (5), and nickel (5)). The present specification thereby provides an example of a particle that has a Mohs' hardness that exceeds the Mohs' hardness of a glass fiber. Accordingly, the present specification demonstrates that the relative hardness varies depending on many factors, including the type of metal and glass used, and thus the Mohs' hardness limitation recited in the claim would not be inherent.

Pollet therefore fails to disclose each and every element of independent claims 1 and 32, and these claims are therefore neither expressly nor inherently described by Pollet. Accordingly, Appellants respectfully request withdrawal of this rejection.

B. Rejection under § 103(a)

The Examiner rejected claims 3, 6-11, 22, 23, and 32-34 as patentable under 35 U.S.C. § 103(a) over Pollet in view of Barber and Jia. Appellants submit that a prima facie case of obviousness has not been established for the reasons set forth below.

To establish a prima facie case of obviousness, three basic criteria must be met. The criteria include that there must be some suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to modify or combine the references, and that there be a reasonable expectation of success for the modification or combination. M.P.E.P. § 2143. "Both the suggestion and the reasonable expectation of success must be found in the prior art reference, not in the applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991).

The Examiner alleges that Pollet "is silent as to the use of the specific inorganic particles and glass fibers." Office Action dated February 13, 2003, at page 4. The

Examiner claims that this deficiency is cured by Barber, which "teaches filaments comprising a core at least partially coated with a coating composition comprising greater than 20 weight percent particles." *Id.* The Examiner also states that Barber "teaches filaments [sic] cores coated with inorganic particulate material, wherein the filament cores can be continuous glass fibers." Final Office Action at page 4. The Examiner then concludes that "it would have been obvious to substitute metallic particulates with boron nitride particles depending upon the desired conductivity of the end product." *Id.* The Examiner also alleges that "Pollet specifically teaches a powdered coating containing inorganic particulates that can be metallic and a powdered coating comprising composite particulates." Final Office Action at 4.

Appellants submit that the Examiner can meet the burden of establishing a prima facie case of obviousness "only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." *In re Fine,* 837 F.2d 1071, 1074 (Fed. Cir. 1988). The factual inquiry whether to combine references must be based on objective evidence of record. *In re Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002).

As argued before the Examiner, in *In re Lee*, the Federal Circuit held that "[t]he factual inquiry whether to combine references must be thorough and searching. It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with." *Id.* Further, the Federal Circuit explained that

> [t]he need for specificity pervades this authority ... the examiner can satisfy the burden of showing obviousness of the combination only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.

Id. (internal citations and quotation omitted) (emphasis added).

Appellants respectfully submit that the requisite objective teaching is not present in Pollet, Barber or Jia to make the selections and combinations suggested by the Examiner. Pollet is directed to a size composition "useful for impregnating a highly loaded, impregnated fibrous strand where the impregnation takes place during the fiber forming operation." *See, e.g.,* Pollet, U.S. Patent No. 5,024,890 at col. 1, lines 10-15. Barber, on the hand, is directed to a composite abrasive filament, while Jia is directed to a filler material for dental composites. Thus, the compositions disclosed in these references are all used for widely differing applications.

Given the divergent nature of these references, Appellants submit that an objective teaching could not be present. Nothing of record indicates how one skilled in the art trying to solve a problem with the composition of Pollet would have been led to search the divergent teachings of Barber or Jia for a solution, and Appellants submit that one skilled in the art would not have been led to do so.

With respect to claims 1 and 32, Appellants respectfully submit that the combination of Pollet, Barber and Jia is lacking any specific, objective teaching regarding the use of a plurality of particles as defined in independent claims 1 and 32. Both independent claims 1 and 32 recite that the "plurality of particles have a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fiber.

Independent claim 1 further recites, in relevant part, that the plurality of particles are chosen from "inorganic particles, organic hollow particles, composite particles, and mixtures of any of the foregoing," and independent claim 32 further recites, in relevant part, that the plurality of particles are chosen from "inorganic particles, organic hollow particles, and composite particles."

The rejection set forth by the Examiner points to no specific, objective teaching in any of the prior art references relied upon in the rejection that would have led to the Examiner's conclusion that "any inorganic particulate material known in the art" could have been used in the teachings of Pollet. In fact, as previously argued before the Examiner, Appellants submit that no such specific, objective teaching exists in these prior art references. In the present case, each of the references, for example, are silent with respect to whether the particles have a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fiber. Based on the § 102(b) rejection, the Examiner believes that, to the extent that a metal particle is used, it will inherently have a Mohs' hardness that is greater that of the glass fiber. As discussed above in Appellants' response to the § 102(b) rejection, this belief is not correct, and metal particles do not inherently have a Mohs hardness greater than the glass fiber.

Because each of the references is silent with respect to the Mohs hardness of the particles, nothing in the references could have provided the objective teaching to select a particle that has a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fiber, as suggested by the Examiner.

With respect to claims 9-11, which recite inorganic particles such as boron nitride, (the elected species of particle), Appellants respectfully submit that the Examiner has not shown that it would have been obvious to use inorganic particles, such as boron nitride, in the composition of Pollet. Specifically, the Examiner has not shown how or why one skilled in the art would have particularly chosen the inorganic particles recited in claim 9, such as boron nitride, for use in the composition of Pollet from the myriad of other particles known in the art and disclosed in the references. Nothing in the references would have directed one skilled in the art to specifically select boron nitride. Thus, the references lack the requisite objective teaching to make the selections and combinations suggested by the Examiner.

Given the divergent nature of Pollet, Barber, and Jia, Appellants additionally submit that there cannot be any objectively reasonable expectation of success in the combination of selected elements from the prior art. Again, nothing of record indicates how one skilled in the art trying to solve a problem with the composition of Pollet would have any reasonable expectation of success to search the divergent teachings of Barber or Jia for a solution. Thus, one skilled in the art could not reasonably expect that combination suggested by the Examiner would function in the size composition of Pollet.

The § 103(a) rejection must therefore fail at least for a lack of any specific, objective teaching to make the combination suggested by the Examiner. Additionally, the Examiner has not shown a reasonable expectation of success from the combination of elements in the prior art.

VIII. CONCLUSION

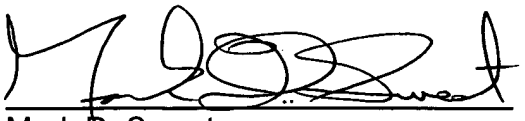
In view of the foregoing remarks, Appellants respectfully request that the rejections under 35 U.S.C. §§ 102(b) and 103(a) be reversed and withdrawn.

Please grant any extensions of time required to enter this Brief and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: July 30, 2004

By: 

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APPENDIX - CLAIMS 1-3, 6-11, 18-25, 32-34 ARE ON APPEAL

1. (Previously Presented) An at least partially coated fiber strand comprising a plurality of glass fibers having a powdered coating composition on at least a portion of at least one of the glass fibers, the powdered coating composition comprising at least one coating comprising greater than 20 weight percent on a total solids basis of a plurality of particles selected from inorganic particles, organic hollow particles, composite particles, and mixtures of any of the foregoing, wherein the plurality of particles have a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fibers.

2. (Original) An at least partially coated fiber strand according to claim 1, wherein the coating composition is a resin compatible coating composition.

3. (Original) An at least partially coated fiber strand according to claim 1, wherein the plurality of particles have a Mohs' hardness value ranging from 0.5 to 6.

4. (Canceled)

5. (Canceled)

6. (Original) An at least partially coated fiber strand according to claim 1, wherein the plurality of glass fibers are selected from E-glass fibers, D-glass fibers, S-glass fibers, Q-glass fibers, E-glass derivative fibers, and mixtures of any of the foregoing.

7. (Original) An at least partially coated fiber strand according to claim 6, wherein the plurality of glass fibers are selected from E-glass fibers.

8. (Original) An at least partially coated fiber strand according to claim 6, wherein the plurality of glass fibers are selected from E-glass derivative fibers.

9. (Original) An at least partially coated fiber strand according to claim 1, wherein the inorganic particles are selected from boron nitride, graphite, molybdenum disulfide, talc, mica, kaolinite, gypsum, calcium carbonate, calcium fluoride, zinc oxide, aluminum, copper, iron, gold, nickel, palladium, platinum, silver, zinc sulfide, and mixtures of any of the foregoing.

10. (Original) An at least partially coated fiber strand according to claim 9, wherein the inorganic particles comprise at least one particle selected from boron nitride particles.

11. (Original) An at least partially coated fiber strand according to claim 10, wherein the inorganic particles comprise at least one particle selected from hexagonal crystal structure boron nitride particles.

12. (Withdrawn) An at least partially coated fiber strand according to claim 1, wherein the organic hollow particles are selected from acrylic polymers.

13. (Withdrawn) An at least partially coated fiber strand according to claim 12, wherein the acrylic polymers are selected from copolymers formed from at least one styrene monomer and at least one acrylic acid monomer, and polymers formed from at least one methacrylate monomer.

14. (Withdrawn) An at least partially coated fiber strand according to claim 1, wherein the composite particles are selected from particles that have a hardness at their

surface that is different from the hardness of the internal portions of the particle beneath its surface.

15. (Withdrawn) An at least partially coated fiber strand according to claim 14, wherein the composite particles are selected from particles formed from a primary material that is coated, clad or encapsulated with at least one secondary material.

16. (Withdrawn) An at least partially coated fiber strand according to claim 14, wherein the composite particles are selected from particles formed from a primary material that is coated, clad or encapsulated with a differing form of the primary material.

17. (Withdrawn) An at least partially coated fiber strand according to claim 1, wherein the composite particles are selected from particles formed from an inorganic material coated with a material selected from silicas, carbonates and nanoclays.

18. (Original) An at least partially coated fiber strand according to claim 1, wherein the plurality of particles are present in the coating composition in an amount ranging from 25 to 80 weight percent on a total solids basis.

19. (Original) An at least partially coated fiber strand according to claim 18, wherein the plurality of particles are present in the coating composition in an amount ranging from 50 to 60 weight percent on a total solids basis.

20. (Original) An at least partially coated fiber strand according to claim 1, wherein the coating composition further comprises at least one lubricious material different from said plurality of particles.

21. (Original) An at least partially coated fiber strand according to claim 1, wherein the coating composition further comprises at least one film-forming material.

22. (Original) An at least partially coated fiber strand according to claim 1, wherein the coating composition comprises a primary coating of at least one sizing composition on at least a portion of a surface of at least one of the glass fibers and a secondary coating composition, on at least a portion of the primary coating, comprising the plurality of particles having a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fibers.

23. (Original) An at least partially coated fiber strand according to claim 1, wherein the coating composition comprises a primary coating of at least one sizing composition on at least a portion of a surface of at least one of the glass fiber, a secondary coating on at least a portion of the primary coating, and a tertiary coating composition, on at least a portion of the secondary coating, comprising the plurality of particles having a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fibers.

24. (Original) An at least partially coated fiber strand according to claim 1, wherein the coating composition comprises a resin reactive diluent.

25. (Original) An at least partially coated fiber strand according to claim 24, wherein the resin reactive diluent is a lubricant comprising one or more functional groups capable of reacting with an epoxy resin system and selected from the group consisting of amine groups, alcohol groups, anhydride groups, acid groups and epoxy groups.

26. (Withdrawn) An at least partially coated fiber strand according to claim 1, wherein the plurality of lamellar particles have a thermal conductivity of at least 1 Watt per meter °K at a temperature of 300 °K.

27. (Withdrawn) An at least partially coated fiber strand according to claim 26, wherein the plurality of lamellar particles have a thermal conductivity ranging from 5 to 2000 Watts per meter °K at a temperature of 300 °K.

28. (Withdrawn) An at least partially coated fiber strand comprising a plurality of glass fibers having a powdered coating composition on at least a portion of a surface of at least one of said glass fibers, the powdered coating composition comprising:

(a) a plurality of hollow organic particles having a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fibers; and

(b) at least one polymeric material different from at least one of the hollow organic particles.

29. (Withdrawn) An at least partially coated fiber strand according to claim 28, wherein the coating composition is a resin compatible coating composition.

30. (Withdrawn) An at least partially coated fiber strand according to claim 28, wherein the plurality of particles have a Mohs' hardness value ranging from 0.5 to 6.

31. (Withdrawn) An at least partially coated fiber strand according to claim 28, wherein the at least one polymeric material is selected from polymeric organic materials, polymeric inorganic materials, and mixtures thereof.

32. (Previously Presented) A glass fiber comprising a powdered coating composition comprising at least one coating comprising greater than 20 weight percent

on a total solids basis of a plurality of particles selected from inorganic particles, organic hollow particles, and composite particles, wherein the plurality of particles have a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fiber.

33. (Original) A fiber according to claim 32, wherein the coating composition is a resin compatible coating composition.

34. (Original) A fiber according to claim 32, wherein the plurality of particles have a Mohs' hardness value ranging from 0.5 to 6.

35. (Withdrawn) A glass fiber comprising a powdered coating composition comprising:

(a) a plurality of hollow organic particles having a Mohs' hardness value which does not exceed the Mohs' hardness value of the glass fiber; and

(b) at least one polymeric material different from at least one of the hollow organic particles.

36. (Withdrawn) A fiber according to claim 35, wherein the coating composition is a resin compatible coating composition.

37. (Withdrawn) A fiber according to claim 35, wherein the plurality of particles have a Mohs' hardness value ranging from 0.5 to 6.